

A N I N Q U I R Y
INTO THE
MORBID EFFECTS
OF
DEFICIENCY OF FOOD,

CHIEFLY WITH REFERENCE TO THEIR OCCURRENCE
AMONGST THE DESTITUTE POOR.

ALSO,
PRACTICAL OBSERVATIONS ON THE TREATMENT
OF SUCH CASES.

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LONDON:
SIMPKIN, MARSHALL, & CO.; AND TAYLOR & WALTON.
MANCHESTER: GEORGE SIMMS.

MDCCCXXXIX.

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P R E F A C E .

THE following Essay is the result of observations made during an extensive practice amongst the Poor, whilst the author was connected with the Royal Infirmary and Poor House, in Manchester. A residence of more than eight years in these Institutions, (where a large proportion of the most indigent classes in this metropolis of the manufacturing district receives medical advice,) has afforded him peculiarly favourable opportunities of acquiring an intimate knowledge of the condition of the poor, of studying their diseases, and investigating the subject of which he treats.

Poverty and want exist largely at all times in populous towns, but the extent to which they prevail when provisions are unusually dear, or employment scarce, can be known only to those who have been in the habit of visiting the poor in their abodes of wretchedness, and have witnessed the extreme destitution they often endure, on those more trying occasions, when the pressure of indigence is increased by the additional affliction of sickness.

During the autumn of 1837 and the succeeding winter, distress prevailed to a lamentable extent, and it was during this period that a large proportion of the facts contained in the following pages was collected. Great numbers of the working classes were then unemployed, and notwithstanding the active exercise of private benevolence, and the most laudable public efforts to afford relief to the sufferers, deficiency of food was very extensively experienced, and several severe and aggravated cases of disease from

this cause, came under the author's notice. Great merit is, indeed, due to Richard Gould, Esquire, and the other Parochial Officers, for their praiseworthy and unremitting exertions to mitigate the suffering, and for the promptitude with which they adopted measures to relieve the almost universal distress. The marked benefit, and decrease of indisposition which took place during a judicious distribution of soup, &c., under the direction of these gentlemen, demonstrated, very clearly, the advantages of supplying food, rather than money, to the poor, on such occasions. When the latter is given, it is too often injudiciously spent in purchasing tea, and other innutritious articles, or even alcoholic liquors, instead of being expended in wholesome and nutritious provisions.

In treating of the morbid effects arising from deficiency of food, it was necessary to advert occasionally to other privations and injurious agents, to which the poor are exposed, and by which these effects are modified and increased: yet it has been the endeavour of the author to confine his observations, as closely as the nature of the subject would permit, to the morbid states particularly attributable to defective nutrition; and he has not attempted to give a complete account of those diseases common to the indigent classes, which may be the combined effect of their occupations, habits, and poverty.

Manchester, May 27th, 1839.

INTRODUCTION.

AN INQUIRY into the morbid effects of deficiency of food is a subject, in which all who have any sympathy for the poor must take a deep interest, and one to which no man endued with the common feelings of humanity can be indifferent. In a country where provision is made by the legislature for the destitute and indigent, and where the assistance of benevolent individuals is ever ready to be extended to the deserving in distress, it is highly desirable that the constitutional indications of defective nutrition should be well understood: in order that those who are really suffering may be promptly relieved, and any attempt at imposture be readily detected.

Yet there is reason to believe that the public in general have very inaccurate ideas of the marks by which this state is distinguished, and the singular symptoms which often attend it; and there can be no doubt that much suffering and loss of life would be spared, if the subject were better understood. Numbers of our fellow creatures have been refused that timely aid, of which they were in extreme need,

and which, in some cases, might have saved them from a premature grave ; not through any want of generosity or feeling on the part of those to whom they applied, but from ignorance of the signs by which exhaustion from want of food is characterized, and mere inability to detect the actually sinking state of the applicant. Many, on the other hand, who were in good health and sufficiently supplied with food, have imposed upon the benevolence of the charitable, and received assistance which they did not require.

The more severe and aggravated effects of defective nutrition come under the notice of the physician, and, in periods of distress, he is often called upon to apply the resources of his art for the relief of diseases thence arising. A gradual deterioration of the moral and intellectual, as well as of the physical condition of man, is the more remote consequence of a slighter diminution in the supply of food, and, as vitally affecting the well-being and prosperity of a nation, has strong claims on the attentive consideration of the legislator.

The public, generally, have a very inadequate idea of the number of persons who perish annually from deficiency of food; and there are few who would not be painfully surprised, if an accurate record of such cases were presented to them. It is true that, in this country, instances of death from *total* abstinence occur only casually; yet every medical man, whose duties have led him much amongst the poor—

who is familiar with the extreme destitution which often prevails amongst them, and the diseases thereby occasioned, is too often a witness to fatal results from gradual and protracted starvation ! Although death directly produced by hunger may be rare, there can be no doubt that a very large proportion of the mortality amongst the labouring classes is attributable to deficiency of food as a main cause, aided by too long continued toil and exertion, without adequate repose,—insufficient clothing, exposure to cold, and other privations to which the poor are subjected. This is a melancholy truth, and is equally to be regretted, whether it arises from the high price of provisions, the low rate of wages, or the improvidence of the poor themselves. That a human being should die from want of food is, under any circumstances, a most painful reflection ; but that such an event should be common in a country which boasts of wealth, civilization, and a tender regard for the welfare of its inhabitants, is a monstrous anomaly, and a stigma little creditable to our professions of Christian charity.

In all densely populated manufacturing districts, where the resources of the working classes are entirely dependent on the fluctuating state of commerce, and a depression in the one is immediately followed by a suspension of the earnings of the other, occasional periods of widely extended distress must necessarily occur. The temporary stoppage of large manufacturing establishments from acci-

dental circumstances, is a frequent cause of great, though more partial distress. But in all large towns, even when no unusual cause of distress is in operation, individual cases of severe suffering from deficiency of food always exist, and unfortunately afford to medical practitioners amongst the poor, constant opportunities of observing its effects.

The following observations on the morbid effects of deficiency of food have been made almost exclusively among the manufacturing population, and as these effects are very considerably influenced and modified by the habits and mode of life of this class, a few preliminary remarks on the subject may not be irrelevant ; in as much as those who are not familiar with the usually delicate state of health, and enfeebled constitutions of these people, would be surprised at the serious evils which result from what might be considered no intolerable deterioration in the quality, or diminution in the quantity of their diet.

With the exception, perhaps, of a few particular branches, I think it will be generally allowed that the earnings of those employed in manufactures are adequate, with prudence and economy, to provide a sufficiency of wholesome food and clothing, and to procure all the necessaries of life. But these classes are notoriously improvident : even in times of the greatest prosperity, they rarely show any disposition to practise economy in the management of their household, or have the prudence to make any pro-

vision for periods of sickness, or other accidental causes, which may occur to put a stop to their earnings. A large proportion even of those who regularly receive high wages are constantly in a state of the greatest poverty, and often bordering on actual starvation—their houses are almost destitute of furniture, comfortless, and uncleanly—too often damp, cold, and ill ventilated. Many of them live in dark cellars, in the midst of filth and putrefaction, by which the atmosphere is rendered foul and unfit for respiration—a due circulation of air being impossible. Their families are ill fed, scantily clothed, and badly lodged; three or four persons being frequently crowded together in the same bed, which is often filthy, and deficient of covering.

They live much on innutritious and indigestible food, and often use articles of bad quality, or such as are rendered unwholesome by adulteration, or by being kept too long. They are extremely intemperate in their habits; and instead of purchasing wholesome food and proper clothing, the greater part of their wages is often expended by anticipation at the public-house. The effect of the intoxicating liquids they consume, is, of course, to produce a temporary excitement of the whole system, which is succeeded by a corresponding depression; they lose all relish for plain nutritious food, and their appetites can be stimulated only by something savoury and piquant. This kind of diet does not afford sufficient nutriment to repair the losses the

body is continually sustaining ; great langour and debility are the consequence—for the removal of which, stimulants are again had recourse to, and thus an alternately excited and depressed state of the system is kept up. By this mode of life too, the digestive organs become impaired ; and the function of digestion is so feebly and imperfectly performed, that even much less nutritive matter is extracted, from the indigestible and impoverished diet they use, than would be the case, if the stomach and its appendages were in a healthy and vigorous condition. A disordered state of the mucous membrane of the alimentary canal is produced ; it becomes irritable and morbidly sensitive—the secretions are vitiated, profuse, or defective, and abdominal pains, diarrhœa, or constipation, is the consequence.

Then again, though many are occupied in sedentary employments, and pass the greater part of the day in heated, crowded, and ill-ventilated rooms ; they take no regular exercise ; they never breathe the fresh and invigorating air of the country, but constantly day after day, inhale the same vitiated and loaded atmosphere. The vital function of respiration—that last and most important process of assimilation, which has for its object the sanguification of the chyle, and rendering it fit for the nourishment of the body, is thus very imperfectly performed. Yet an uncontaminated atmosphere for the lungs, is as essential to the maintenance of health, as a supply of wholesome food to the sto-

mach ; and it is impossible the frame can continue vigorous under such a regimen. It is of little avail that nutritious food be digested and converted into chyle, if it is not further prepared for being changed into blood, by exposure to the action of pure air in the lungs.

From the heated apartments in which the people employed in manufactures work, they, too frequently, rush into the open air, without any additional clothing, however wet or cold the weather may be. By these sudden transitions into a cold and damp atmosphere, the cutaneous circulation and transpiration are checked ; the blood is accumulated in internal parts, and visceral congestions and inflammatory attacks, more especially of the mucous passages of the lungs and alimentary canal, from the reciprocal action between these parts and the skin, are continually occurring.

Other causes affecting the health of the manufacturing population, are the protracted length of time they are confined daily at their work ; the want of requisite repose, and the little leisure they have for relaxation and healthful recreation. It is true that their employment is not generally laborious, often much less so than that of out of doors workmen ; but it is its long continuance, and the sense of weariness and exhaustion, consequent on the unremitting attention it requires, which are so injurious. This prolonged and unceasing attention is accompanied with considerable expenditure

of nervous energy, and has a powerfully depressing effect on all the vital functions, without the advantage of rendering the appetite keen, and the digestion energetic : effects which more active employments in the pure atmosphere of the country produce, and by which the exhaustion and waste consequent thereupon, are quickly repaired. In the former kind of occupation, mental relaxation and exercise in the open air are more especially required, and are in fact the appropriate restoratives. Yet for these, the manufacturing population have not the leisure, if they had the inclination ; when their hours of labour are finished, they too often only exchange the close air of their work-rooms for the worse atmosphere of the tavern.

The injurious effects of the above habits and mode of life, are abundantly evident in the squalid appearance—the pale and haggard countenance, premature old age, the slender frame and general deficiency of muscular development, as compared with the labouring classes in an agricultural district. They are feeble and languid ; their appetite is often capricious and defective ; their nervous system alternately morbidly excited and depressed, whilst their muscular and vascular systems evince a want of tone and power.

A consideration of the foregoing facts is sufficient to show, that, at all times, even those of the greatest prosperity, a large proportion of the manufacturing classes is far from being in a state of vigorous

health, and that many of them are on the verge of actual disease. And it must be acknowledged that even when the utmost precautions are taken to avoid the accession of disease, and the most judicious means adopted to preserve their health, they will necessarily be less robust, and more delicate in constitution, than those inhabiting the country, who are much in the open air, and escape many of the injurious and depressing agents to which the former are exposed. But when, to the unavoidable deleterious and enervating influence of their occupations, and their living in crowded situations, are added their habits of dissipation and drunkenness, alternately suffering from privation and excess ; their consequent poverty and destitution, their inattention to cleanliness and domestic comfort ; and their neglect of many other important measures of hygiène, quite within their reach, we cannot wonder at their impaired health and enfeebled constitutions ; and we may well conceive them to be in a condition strongly predisposed to suffer from deficiency of food, and little capable of resisting the inroads of disease, under a continuance of privation and want. It must be remembered also, that, during periods of distress, all the other privations, in addition to scarcity of food, to which the poor are subjected, are experienced with double severity, and aid in increasing its ravages.*

* For more extended information on this subject, Dr. Kay's work on "The Moral and Physical condition of the Working Classes, employed in the Cotton Manufacture of Manchester," may be consulted.

It ought to be observed, that the remarks I have made, as to the delicate state of health, and impaired constitutions of the manufacturing population, apply with equal force, to tailors, shoemakers, and other artisans of sedentary occupations, living in large towns, who are exposed to the same injurious and debilitating influences as the former ; and are certainly, not less intemperate, less improvident, or more healthy. In fact, I have no doubt that the employments of the latter, are much more injurious to their health, than the occupation of those who work in factories, where the air is generally more pure, and the apartments better ventilated than the low and close workshops of the various classes of artisans.

Before entering upon the immediate object of this Essay, I shall call the reader's attention to a few physiological facts, bearing upon the subject, which it is proper we should bear in mind, when examining the morbid phenomena resulting from defective nutrition.

CHAPTER I.

ON THE NUTRITION AND WASTE OF THE BODY.

THE components of all living beings are constantly changing, and so rapidly does this change take place, that in a few years probably not an atom of their original structure remains. Life is, in fact, a continued succession of renovation and decay, and may be said to consist of a series of operations, by which the component parts of the body are removed, and by which that loss is again supplied.

In every living being, from the first moment of its existence, this expenditure and renewal of the materials of which its frame is composed, are uninterruptedly going on as long as vitality remains.

Between this absorption of the old, and deposition of new particles, a due balance in the healthy state is maintained, and the natural bulk is nicely preserved ; but when either predominates, emaciation or obesity ensues.

The amount of matter discharged daily from the human body is affected by numerous causes, and is subject to endless variations ; but the average quantity lost by a person in good health, of regular habits, and not undergoing more than ordinary

exertion, has been calculated at 91 ounces : of which about $30\frac{3}{4}$ escape by the lungs, $6\frac{3}{4}$ by the skin, $48\frac{1}{2}$ ounces pass off as urine, and 5 as fœces.* The whole of the matters thrown off by the lungs, skin, and kidneys is separated from the blood, and even of that discharged from the bowels (which amounts only to an eighteenth part of the whole) much is derived from the same source ; for the bile and secretions from the other glands and mucous follicles which pour their contents into the intestines, constitute a considerable portion of the alvine evacuations.†

This large and continual drain from the blood is replaced by the absorption of a fluid, elaborated by the process of digestion, from the aliment received into the stomach. To furnish this fluid therefore, a regular supply of nutritive matter is requisite, and, if this is not duly afforded, emaciation is soon perceptible ; for not only is nutrition, or the deposition of new matter, suspended, but the function of absorption proceeds with more than ordinary activity. A long continuance of this state is incompatible with life, but the period during which an animal can exist without nutriment, varies according to its organization, habits, and other circumstances : some species being capable of enduring abstinence for a great length of time, whilst in others, death quickly follows the total privation of food. The Boa Constrictor,

* Dr. Dalton in Manchester Memoirs. Vol. 5. 2nd Series, page 303.

† Ibid. Page 316.

for example, probably does not eat more frequently than once in two or three weeks, and is able to fast much longer with impunity ; and the sluggish tortoise will live for months without food. Most of our domesticated animals, on the contrary, are soon destroyed if food is withheld for a comparatively short period. It is ascertained that warm blooded animals suffer earlier from the want of food, than those which circulate cold blood : and it may be stated generally (though this is not without exceptions) that the higher we ascend in the scale of organization, the capability to bear abstinence decreases.

The varied conditions in which man is placed, from his general dispersion over the surface of the globe, the accidents and privations to which fortuitous circumstances have exposed him, and the difficulties he has occasionally met with in obtaining food, have shown that he is capable of considerable latitude in his endurance of abstinence, and that, under peculiar circumstances, life may be supported for a considerable period by a very small allowance of aliment. Disregarding, as unworthy of credit, all those cases where persons are said to have lived for weeks, months, and even years, without having partaken of any food, numerous instances of prolonged fasts might be collected from authors of accredited veracity. Nevertheless, common observation shows that man *very soon* begins to suffer both mentally and physically, when he is deprived

of a due proportion of nourishment ; and it is certain that, in the healthy state at least, he cannot generally support hunger and thirst longer than a week or ten days, without fatal consequences. It is known however, that when water is plentifully supplied to allay thirst, life may be prolonged to thirty or even forty days.

In nothing are the effects of habit more conspicuous, than in its influence on the quantity and quality of food which man consumes, or the intervals at which he takes it. In his savage state, where he depends for subsistence on the uncertain products of the chase, and takes no forethought for the following meal, when the present cravings of hunger are satisfied, his periods of eating are much protracted, his appetite is often voracious, he is accustomed to eat enormous quantities at one repast, and he acquires a surprising capability of bearing long fasts. In the upper ranks of civilized society, on the contrary, when the meals are always prepared at regular intervals, where no privation or delay is ever experienced, and the appetite has been accustomed to be unnaturally stimulated by variety, and the aid of a refined and luxurious system of cookery, painful exhaustion is soon felt if eating is deferred but a few hours, and a lengthened fast would probably produce serious consequences. Amongst the lower ranks again, though the nature of their occupations or absolute poverty occasionally prevents them from always satisfying their hunger at the time

it is felt, they are in general regularly supplied with food (except in periods of distress or scarcity) and are incapable of bearing very protracted abstinence.

The quantity of nutritive matter requisite to maintain the body in a state of vigour, varies greatly according to circumstances, depending much upon the constitution, but more particularly on the kind of life which the individual leads, and consequent amount of loss which the body is undergoing. Of this, the appetite, in health at least, is a pretty accurate index, and will generally be proportionate to the wants of the system. When much exercise is taken, and great exertion used, the exhalation from the skin and lungs being augmented, there is a large expenditure, and an increased quantity of food is necessary. In those, on the contrary, who lead sedentary and inactive lives, the expenditure is comparatively small, and a much less allowance of aliment is required. The small quantity of nutritive matter which has sometimes sufficed to support life under such circumstances, is almost incredible. Bearing somewhat upon this point is that state of complete torpor and inactivity, termed hybernation, in which animals live for months without any supply of food. Though the vital functions are not totally suspended during this period, they are so languidly performed, that very little loss is sustained by the body. That some waste, however, is going on, is evident from the fact, that, though an animal may be fat at the commencement of hybernation, it is

always observed to be lean when it revives ; the requisite supply to the blood having been furnished by the absorption of the adipose tissue.

Young persons, and more especially children who are growing rapidly, require much nutriment, not only to repair the great waste which the active life they lead causes, but to furnish new matter for the growth of the body, and to complete the development of particular organs. The loss of infantile life amongst the poor from want of attention to this circumstance is very great. This is principally owing to their being *too seldom* fed ; for in infants, digestion of their appropriate diet, milk, is very rapid, and being taken only in small quantities at a time, it is necessary to repeat it very frequently. As however, they are often entrusted to the care of a person who nurses them for hire, whilst the mother is engaged at work—this precaution is not sufficiently attended to. Children so neglected often linger for a long time affected with diarrhœa, or all the symptoms of hydrocephalus, whilst those who have the charge of them do not suspect the real cause of their illness.

On the contrary, in adults and in old age, when growth has ceased, less food suffices. In the latter state especially, when, from increasing infirmities, all active habits have been given up, a very small allowance of nutriment indeed is sufficient to repair the diminished expenditure.

During recovery from acute illness, when great

emaciation has taken place, the appetite being keen and quickly returning, digestion is energetic, and the demand for food is urgent ; so that enormous quantities are taken, and are required, to repair the waste which the system has undergone.

These remarks suffice to show how necessary it is that the quantity of aliment taken should be duly proportioned to the expenditure, and it must be very evident, that the health will be as certainly injured by the use of a full and nutritious diet, in inactive states of the system, as by restriction to scanty and impoverished food, when much exertion and exercise are used. Examples of disease from the former cause are proportionally as numerous in the upper and middle classes, as those from the latter are amongst the poor.

As to the kind of food best suited for the maintenance of the body in health, equal differences exist, arising from a great variety of causes, as climate, age, habits, &c., and nothing definite can be said on the subject. It is clear, from the structure of the teeth, and the digestive organs, that man was not intended by nature to be restricted exclusively to either animal or vegetable food, but was meant to live on a mixed diet. Though there can be no doubt that this latter is the most appropriate for his sustenance, yet at the same time, the mixed character of his bodily organization tends to show that great latitude is admissible in this respect ;

and abundant evidence exists to prove that he is capable of living on either kind of food exclusively, when he is so situated as to render the use of a more mixed diet impossible.*

* Dr. Elliotson.—Human Physiology: London, 1835, page 62.

CHAPTER II.

THE SYMPTOMS OF DEFICIENCY OF FOOD.

THE first indications of a deficiency of food, or the use of a very innutritious diet are, languor, exhaustion, and general debility, with a distressing feeling of faintness and sinking at the præcordia, chilliness, vertigo, and a tendency to syncope. The emaciated appearance of the patient, his pallid and inanimate countenance, the pale blue colour of the conjunctiva, and the unsteadiness of his movements, are the most striking external signs of this state. The temperature of the surface, particularly of the extremities, is diminished,—the pulse is feeble, but not usually frequent, though very easily excited, the breathing slow and sighing, the voice weak and tremulous; the tongue is white, large, exsanguineous, and often indented by the teeth; the bowels are confined, the urine limpid, and not generally deficient in quantity. The cerebral functions suffer equally with those of the other organs, and the mental powers exhibit a languor and dulness proportionate to the degree of the physical debility. The sufferer is listless and depressed, and often manifests a remarkable apathy to his condition.

If the cause still continues in operation, all these symptoms are aggravated, and some very alarming ones referrible to the nervous system, and indicative of sinking, are added. The feeling of prostration becomes quite overpowering, and the exhaustion and muscular weakness are so great, that the erect posture can, with difficulty, be maintained. The depression of all the vital and mental powers is fearfully augmented, the whole body becomes shrunk, the countenance more haggard, and the features collapsed; the eyes are sunk in their orbits, the bones of the cheek project, and the effects of the absorption of fat are everywhere visible, denoting the preternaturally active state of that function. The breathing is often irregular and panting, palpitations of the heart are frequent, a dull obtuse pain is felt in the head, and there is drowsiness, with occasional delirium. Dizziness, transient dimness of vision, staggering and syncope are common, and very apt to be produced by the erect posture or by any exertion. A decidedly lethargic state now approaches, the pupils become dilated, the eyes are dull and besmeared with mucus, the skin is covered with a clammy sweat, and a mawkish or fetid odour is emitted both from it and from the lungs. Partial paralysis or hemiplegia is not uncommon, and muscular twitchings and sometimes convulsions occur. If delirium exists, it is generally of a low kind, and is soon succeeded by complete coma, when the case corresponds to the "apoplexia

ex inanitione" of some writers. During the whole course of the affection the tongue usually continues moist, and is not much loaded.

In some cases the patient remains perfectly sensible up to the period of dissolution, and appears to die from failure of the heart's action, without any supervention of coma.

Sometimes, though much more rarely, greater reaction occurs, and the symptoms assume more of a decidedly febrile character; the pulse is rapid, the skin hot, and thirst more urgent, the tongue dry and conjunctiva injected. Instead of exhibiting the gradually increasing lethargy and mental imbecility, I have described, the patient is irritable and agitated, the countenance is expressive of anxiety, there is great restlessness and wakefulness, the delirium is of a more active kind, and the train of symptoms very much resembles those of low nervous, or adynamic fever, or sometimes even assumes the appearance of cephalic inflammation. This form of the affection seldom occurs except in those who have led very intemperate lives, and whose constitutions have been impaired by the abuse of intoxicating liquors. Many of the symptoms may be attributed to the withdrawal of their accustomed stimulants, and have a great resemblance to those of delirium tremens.

The above is an enumeration of the most striking symptoms which usually exist; and though the absence of some, or the addition of others, may cause considerable variation in individual cases, yet

the general features of the affection have a tolerably uniform character.

It may be well to state however that the symptoms above detailed are those which accompany a more regular and continuous deficiency of food, than the cases usually met with in practice amongst the poor, present; for it seldom happens that even the most destitute do not obtain, at longer or shorter intervals, from some source or other, a supply of food which eases, temporarily, their sufferings. But I thought it better to describe the progressive increase and course of the symptoms, as they are observed in the severer and most unmixed form of this morbid state, in order to convey to the mind a more clear impression of its progress towards a fatal termination, rather than interrupt the description by digression or any explanatory remarks.

I shall now, however, speak more fully of the more important symptoms, and afterwards notice some occasional deviations observed, when deficiency of food is associated with other hurtful agents, or occurs in peculiar states of the system.

The effects of defective nutrition may, of course, vary, from the most trivial deviation from health to the destruction of life, according to the degree to which the abstinence is carried; the length of time during which it is endured—whether it is entered upon suddenly or gradually—whether continuous, or interrupted with occasional supplies of food, and according to the kind of diet used. The effects will also be modified by the age, temperament, previous

state of health, and habits of the individual sufferer, as was stated in the preceding chapter.

In cases of very gradual starvation, an urgent feeling of hunger or craving for food is not a prominent symptom ; and even when it exists at first, (as in cases of more sudden fasting) it usually soon diminishes, and is succeeded by a feeling of exhaustion and faintness, and sometimes even by a loathing of food, if the abstinence has been long protracted. Indeed, derangement of the functions of the stomach, marked by anorexia and impaired digestion, is one of the most constant indications of the use of a very scanty or impoverished diet ; so that, singular as it may seem, a defective appetite is a very frequent symptom of that gradual starvation, from which the poor suffer, during periods of distress. It is no doubt true, that the feeling of hunger is generally proportionate to the wants of the system, as is well exemplified in *Tabes mesenterica*, where the appetite is scarcely ever satisfied, although large quantities of food are taken. In this disease, digestion is well performed, and abundance of chyle elaborated ; but, not being able to pass through the lacteal vessels from the diseased state of the glands, it affords little nourishment to the body, and therefore does not satisfy the craving for food. Nevertheless, careful observation has convinced me, that a long continued privation of adequate nutriment, blunts the feeling of hunger as well as other sensations ; effects, which must, in some degree, be

attributed to the despair of poverty, and that moral depression and despondency, which an individual naturally experiences, who is in so destitute a condition as to be suffering from want of food, and the common necessities of life. In the history of the case of a gentleman, who died from inanition, in consequence of obstruction in the œsophagus, minutely detailed by Dr. Currie ; he remarks, “ Mr. M. complained very little of hunger. Occasionally he expressed a wish that he could swallow, but not often, nor anxiously ; and when questioned on the subject of his appetite, always declared that he had no hunger to occasion any uneasiness.”* Neither does it appear in Franklin’s account of the dreadful sufferings which were endured by the expedition to the Polar sea, from want of food, that the feeling of hunger was generally very distressing.† In one place he says, “ The voyagers were somewhat stronger than ourselves, but were more indisposed to exertion, on account of their despondency. The sensation of hunger was no longer felt by any of us, yet we were scarcely able to converse upon any other subject than the pleasures of eating,” page 427. And again it is remarked, “ Indeed all along after the acute pains of hunger, which lasted but three or four days, had subsided, we generally enjoyed the comfort of a few hours’ sleep,” page 465.

In reduced states of the system from inanition,

* Currie’s Medical Report, page 234.

† Narrative of a Journey to the Shores of the Polar Sea : London, 1823.

the secretions are diminished ; and, in consequence of this, of the small quantity of food taken, and of the increased activity of absorption, by which some portion of matters which would ordinarily have passed out of the body with the fæces, is probably taken up into the circulation, the bowels, as already stated, are generally confined, and the evacuations hard, dry and small. But when an individual has suffered during a long period from a deficient supply of food, diarrhæa or dysentery often supervenes. Gastralgia is also not an unfrequent symptom. . It is occasionally of an acute character, but is more commonly described as a dull gnawing pain.

The generation of heat, as well as all the other vital functions, is much influenced by the state of health and nutrition. When the system is weak and exhausted from deficiency of food, much less heat is evolved ; the temperature is very readily reduced, and the body suffers from a degree of cold, which, under a plentiful supply of nutritious aliment, would have been borne without inconvenience. In Franklin's narrative before quoted, it is remarked, " During the whole of our march, we experienced that no quantity of clothing could keep us warm whilst we fasted, but on those occasions on which we were enabled to go to bed with full stomachs, we passed the night in a warm and comfortable manner."* In the generality of cases of suffering from deficiency of food, the reduced temperature of

* Page 424.

the body is permanent ; and although transient accessions of febrile heat and flushing sometimes do occur, it is seldom until the patient has been supplied with food ; and they may be regarded rather as the effects of reaction during recovery, under the stimulus of nourishment and remedies, than as the ordinary consequences of inanition. It is important to bear in mind the readiness with which the temperature of the body declines in individuals suffering from want of food ; for during severe winters, many lives are lost, even in this climate, from the combined effects of cold and inadequate nutrition ; especially amongst infants and very old persons, in whom there is less power of evolving heat, and maintaining the natural temperature, when placed in cold media, than in the middle aged.

One of the most remarkable features of the effects of deficiency of food, is the morbid affection of the nervous system, and an examination of these phenomena will be found to possess much interest.

The first symptoms marking an extreme degree of exhaustion, and indicating danger, are referrible to this source. These are of so striking a character, that they cannot fail to attract attention, but the earlier and slighter derangements are apt to be overlooked.

The depression produced on the nervous system is very early manifested in the impaired energies of all the vital functions, the weakened condition of the intellectual faculties and moral feelings, and

diminution of the general sensibility. Disturbance of the cerebral functions is first shown by an unnatural langour, despondency, and listlessness; slowness and hebetude of intellect, with an inability to employ the thoughts steadily or profitably on any subject. Notwithstanding all this general langour, however, the patient sometimes manifests a highly nervous state; he is startled by any sudden noise, and hurried by the most trifling occurrences. He is liable to attacks of giddiness, "swimming in the head," staggering, dimness of sight, with temporary delirium, and either falls as in an apoplectic fit, or lapses gradually from a lethargic state, into one of stupor or even complete coma.

In many respects, the symptoms in these cases have considerable resemblance to the effects of exposure to cold.

Mania or mental imbecility has sometimes been produced by defective nutrition. The former is the common effect of sudden privation of food, whilst the latter is the more frequent consequence of gradual starvation. The sufferers on the wreck of the French frigate, "Meduse," became maniacal from exposure and fasting; and cases are often seen in pauper lunatic asylums, where loss of intellect has been brought on by deficiency of food, and the want of the common necessities of life.

In consequence of the torpor of the brain and intellectual faculties, it is often extremely difficult to obtain the requisite information from patients.

Instead of showing any anxiety to communicate the symptoms and cause of their illness, or to relate the privations they have undergone, they generally have an unwillingness to be questioned—lie in a listless or lethargic state, without taking any notice of what is going on, and seem desirous only not to be disturbed.

It has often been remarked of beggars, that those who are really in distress, and in the greatest want, are generally the least importunate in their solicitations for charity; and our generosity is often more successfully appealed to by the distressed look, and suffering countenance of the petitioner, than the earnestness or perseverance with which he craves our succour. It is a popular saying, that hunger will break through stone walls, by which it is implied, that its calls are not to be resisted and that the most difficult obstacles will be overcome to satisfy it. This may be true of hunger induced by sudden fasting, occurring to persons in good health, but is very far otherwise, when an individual is suffering gradually and becoming exhausted by slow degrees, from a long continued deficiency of food, or the use of a very impoverished diet. In such cases, when the health begins to decline, mental obtuseness and diminished sensibility follow; all the sensations are blunted, and the feeling of hunger being feebly experienced, no very strenuous efforts are made to allay it. The mind partakes of the physical debility, and tears are excited as readily as in some cases of

hemiplegia, or other diseases where the nervous system is much weakened.

If the feeling of hunger was experienced by the poor, when suffering from gradual starvation, with the same degree of irresistible violence and intensity, that it is by persons in robust health, when suddenly deprived of food, violations of the law would be much more frequent, during periods of general distress, than they now are ; for it is very certain that neither the highest moral principles, nor the most conscientious dread of moral guilt, nor any fear of the most rigorous legal punishment, would be powerful enough to restrain them from taking any means within their reach, to relieve the pangs of hunger.

In the foregoing remarks, I believe I shall be borne out by those who are in the habit of administering relief to the poor. They well know that it is the stout, and those in good health, who are most obstinately persevering in their importunities, and urging their claims for assistance ; whilst those who are greatly exhausted and really suffering from the effects of deficiency of food, make comparatively but feeble efforts to obtain that which is absolutely necessary for their existence.

These circumstances, in addition to the extreme reluctance which many individuals, reduced in circumstances, have to apply for parochial relief, cause some to defer their application, and even to conceal their poverty and distress, till highly serious and possibly fatal consequences ensue. A consideration

of these facts ought to make us cautious in passing indiscriminate censure upon overseers of the poor, when such cases do unfortunately happen ; for neither the ample provisions of the law, when most humanely and judiciously administered, nor the active benevolence of private individuals, can prevent the occasional occurrence of such accidents. It ought, however, to be duly impressed upon overseers, that it is their duty to inquire into the circumstances of those, who, from a constitutional delicacy of feeling, are likely to shrink from applying for relief, when their destitution and necessities require it.

Careful observation has convinced me, that the listlessness and torpor of the mental faculties—the tendency to fainting or perfect syncope, and finally, a state of cerebral oppression, amounting in some cases to coma, are among the most characteristic symptoms of defective nutrition, and the surest indications of its existence to a serious extent.

The effects, too, on the moral feelings, are very striking and often truly deplorable. As the sufferer's resources are gradually exhausted, and his poverty increases, he becomes gloomy and dispirited ; his physical exhaustion so paralyzes the energies of his mind, that he has neither the disposition nor the power to make an effort to assist himself ; and he would rather dose away his time and perish, than rouse himself to any exertion.

The depressing influence of inadequate nutrition

on the mind, is well illustrated in several passages in the narrative of Capt. Franklin, before quoted :—
 “These circumstances,” he observes, “rendered the men again extremely despondent ; a settled gloom hung over their countenances, and they refused to pick *tripe de roche*, choosing rather to go entirely without eating, than to make any exertion.” page 426. “This gloomy weather contributed to the depression of spirits, under which Adam and Sam-andrè were labouring. Neither of them would quit their beds, and they scarcely ceased from shedding tears all day ; in vain did Peltier and myself endeavour to cheer them. We had even to use much entreaty before we prevailed upon them to take the meals we had prepared,” page 445. Again it is remarked, “The fact is, that with the decay of our strength, our minds decayed, and we were no longer able to bear the contemplation of the horrors that surrounded us,” page 454.

It may perhaps be thought by some, that I have given an exaggerated description of the effects of defective nutrition on the intellectual faculties and moral feelings ; but I believe those who are most familiar with the condition of the poor, when suffering from sickness and the despair of poverty will recognise the fidelity of the picture I have drawn. If I have dwelt somewhat tediously on this part of my subject, I have done so under a conviction of its paramount importance, and the impression that the phenomena in question are not so generally

understood, nor their value as diagnostic marks so fully appreciated, as the more strictly physical signs of starvation.

I am aware that the group of symptoms I have enumerated, as the result of defective nutrition, is in some respects at variance with the accounts given by several authors, who describe this morbid state as one of considerable excitement and fever, accompanied with cerebral irritation, and a disordered acuteness of the mental faculties ; great watchfulness and general irritability of the whole system, in place of the lethargic condition I have stated as accompanying it.

But it must be borne in mind, that the persons from whom my observations have been taken, are subjected, during periods of distress, to a multitude of depressing causes and injurious agents both moral and physical, besides the deficiency of food ; that these are often in operation a great length of time, and gradually reduce the system and depress the spirits before any specific mischief is produced. These circumstances must greatly modify the effects and may probably offer a satisfactory explanation of the differences alluded to.

When starvation has occurred under circumstances of great horror, during some overwhelming catastrophe, as in shipwrecks ; or in cases in which abstinence has been voluntarily endured, even to a fatal termination, when the mind has been powerfully operated upon by enthusiasm, fanaticism, or

some delusion, great modification of the symptoms might also be expected. It is very improbable indeed, that in such cases the symptoms would coincide with those observed among an impoverished population, whose health has been gradually undermined by a long continuance of privations, and whose spirits have been broken by struggling with increasing adversity.

It is perhaps scarcely necessary to remind the reader, that the severe and advanced forms of disease described above are of extremely rare occurrence, compared with the multitude of cases of minor degrees of suffering, and milder train of phenomena which are met with in general practice amongst the poor ; for it is seldom that the deficient supply of food is carried so far, or so long continued, as to produce such alarming symptoms. There is more commonly merely such a diminution as to produce, by slow and gradual operation, a species of anæmia, or a cachectic state of the system, in which an unhealthy condition of the viscera generally, exists, in which the secretions are defective or vitiated, nutrition interrupted, and all the functions imperfectly performed, but without any decided affection of any particular organ. Such a state is indicated by a sallow and dingy appearance of the skin, a soft and flabby feeling of the flesh, more or less emaciation, general debility, feebleness of the circulation, and frequently swelling of the ankles. The stomach becomes disordered, the appetite defective, and diges-

tion impaired. The individual feels languid and desponding, is soon fatigued, incapable of exertion, and has an irresistible disposition to fall asleep, from which he is apt to awake suddenly and in a fright. The body is easily chilled, breathlessness and palpitations are experienced after slight exertion ; attacks of vertigo, tinnitus aurium, and transient blindness are common, and there is a peculiar forlorn and dejected aspect of countenance which is very characteristic. This state of things is commonly soon succeeded by some specific disease, though it sometimes continues, with slight variation, for a very protracted period : until the patient falls by slow degrees into a state of mental, as well as physical incapacity, and being no longer able to pursue any employment, is completely invalided, and applies for medical relief.

In young children, defective nutrition is manifested by gradual wasting away ; fretfulness, diarrhoea, and often all the symptoms of cerebral congestion or hydrocephalus.

Before leaving this part of the subject, it may be interesting to say a few words on the symptoms of sudden and complete abstinence, as contrasted with those resulting from a partial and merely deficient supply of food, as detailed in the preceding pages.

From the accounts of authors who have described the effects of total abstinence, happening to persons in good health, and whose systems have not been exhausted by previous privation and want, it appears

that there is a more intense and insufferable feeling of hunger,—agonizing thirst, a parched tongue, great febrile action, sleeplessness, morbid acuteness of the intellect, general irritability of the whole frame, considerable excitement of the nervous system, frequently maniacal delirium, and very rapid emaciation.

These differences might have been anticipated, and are easy of explanation. In the cases which are the subject of this paper, even if the deficiency of food be very great, the severity of the symptoms is mitigated by the plentiful supply of water, which is always attainable. By this free use of fluids, the febrile symptoms are relieved, exhalation and secretion promoted, the mouth and mucous membranes kept moist, and the tissues generally moistened; the vessels contain more blood, so that the shrinking of the body is retarded, and the absorption of the adipose tissue rendered less evident. In the one case, the symptoms are those of febrile action and cerebral irritation; in the other, they seem referrible to deficient innervation, owing to the incapacity of the thin and impoverished blood to afford the necessary stimulus to the brain and nervous system, and the disordered state of the circulation within the head, which will hereafter be considered.

I may briefly allude in this place to the injurious consequences, which, it is well known, have occasionally been produced by a too rigid abstinence

having been injudiciously recommended, or too long persevered in by medical men. This has particularly happened where irritation has been mistaken for inflammation, or where the necessary change from a low to a nutritious diet, in acute diseases, has been too long delayed. Little similarity, however, obtains, between the symptoms in such cases, and those produced by starvation amongst the poor; and it is on this account, especially, that I wished to notice it, as by the inexperienced, greater uniformity might be looked for. In the former, there is a highly excited state of the nervous system, febrile heat, and flushing of the countenance, a quick irritable pulse, irregularities of the heart's action, throbbings in the head, sudden startings, and frequent attacks of pain in various parts of the head. The symptoms continue to increase as long as the abstemious diet and other antiphlogistic measures are employed, and their resemblance to those of a real inflammatory disease becomes still more close, and yet more fallacious.

CHAPTER III.

GENERAL REMARKS ON THE MORBID EFFECTS OF DEFICIENCY OF FOOD.

It must not be inferred that the injurious effects of deficiency of food upon the health, are always manifested by the peculiar and marked symptoms described in the last chapter. On the contrary, the instances in which defective nutrition is followed by what may be called, its special and characteristic signs, are infinitely more rare, than those in which it acts merely as a predisposing cause of morbid action, and favours the developement of some specific disease. The destruction of life amongst the poor, in this indirect manner, is most extensive ; but, from death being readily referred to some particular disease, to which a name can at once be given, it attracts little notice. In many of these cases, there is nothing peculiar in the symptoms, to indicate the real cause of their origin ; the disease may be far advanced before a medical man is consulted, and his attention, as well as that of the patient himself, being more especially directed to the present pathological condition of the organ affected, unless the former is minutely particular in his inquiries ; the true source

of the complaint may not be recognised, or may fail to make any strong impression. Yet, in estimating the mortality amongst the destitute poor from scarcity of food, we must not forget that the result is still the same, whether the privation is so complete as to destroy life in ten days, or so slight and gradual, that the fatal event does not occur till after many months' suffering.

In persons labouring under an impaired state of health from deficiency of food, there is a remarkable susceptibility to the effects of contagion, unwholesome conditions of the atmosphere, vicissitudes of the weather, and, in short, to all the existing causes of disease; and it is this class which always suffers most severely, during the prevalence of endemic, epidemic, or contagious disorders.

It is a matter of notoriety that fever usually prevails extensively during periods of distress and scarcity, and that the most destitute are its most frequent victims. Nevertheless, I am by no means satisfied that deficiency of food is, in itself, so frequent a cause of fever, as some have supposed; and am rather inclined to believe that it acts generally as a powerful predisposing cause only. This view of the matter will account satisfactorily for the rapidity with which it spreads, amongst a half-starved and ill-fed population, when it has once been generated, as the supposition that defective nutrition itself is the efficient cause. I have been led to this opinion from having observed, that it has often pre-

vailed in one part of the town, where the inhabitants were not more impoverished, or in a worse condition, than in another part which was almost entirely free from the disease ; and I can unhesitatingly say, that, during an extensive attendance upon the poorest and most destitute portion of the labouring classes, I have very rarely met with a case of fever, which could, with fairness, be attributed to deficiency of food, where there was not either suspicion of contagion, or the patient had not been surrounded with filth, and living in a foul and vitiated atmosphere, sufficient in itself to originate the disease.

It is almost unnecessary to remark, that fever attacking persons much reduced by defective nutrition, assumes a low adynamic type : there is great cerebral oppression—the circulation is enfeebled—the surface is easily cooled—petechiæ are frequent, and an irritable state of the bowels, terminating in ulceration of the mucous membrane, is not an unusual symptom.

There is a great variety of chronic diseases, whose origin is excited, or whose progress is increased with frightful rapidity by inadequate nutrition ; and the number of persons amongst the poor, whose death is accelerated from this cause, it is melancholy to contemplate. It is amongst these habitual invalids that the greatest mortality occurs during periods of distress ; yet, except in a very few instances, the remote cause of death is unknown to the public, and this event is considered merely as the natural and

necessary consequence of the disease under which they were labouring, at the time of their disease. Even if any suspicion is aroused that a person has died of starvation, and a *post mortem* examination instituted to ascertain its probability; if structural disease of any important organ is found, it is too generally assumed, as a matter of course, that death has arisen from natural causes. Yet no conclusion can be more fallacious, for persons affected with organic diseases are certainly not less susceptible of the effects of deficiency of food than healthy individuals, and not less likely to perish in consequence.

Scrofula in all its varied forms, tubercles, dyspepsia, diarrhæa, dysentery, scurvy, petechiæ, dropsy, an ulcerated or aphthous state of the mouth and throat, chronic ulcers, &c., may be mentioned as some of the most common diseases prevalent amongst the destitute poor, and which frequently originate in deficiency of food. And I have met with one or two cases of paraplegia, which seemed to have originated from the same cause.

Those persons who are naturally delicate and feeble, who have any hereditary or constitutional tendency to morbid action, or who have great susceptibility to external impressions, moral or physical, suffer most severely and early during periods of distress; whilst the robust and plethoric bear the same privations with comparatively little inconvenience.

If any particular organ is weak, or possesses a latent predisposition to disease, it will be the first to suffer, and will often exhibit disorder, before any marked effect has been produced on the system generally ; so that in one person phthisis, in another diarrhæa, in another mental imbecility, may be the consequence of deficiency of food. If tubercles exist in the lungs, even in the most early stage, or if there be merely a tendency to their development, the rapidity with which the symptoms advance is very remarkable. Cases illustrative of this fact must be familiar to every medical man. Nothing is more common than for patients, who are known to have tubercular deposition in the lungs, to remain in an hospital, where an appropriately nutritious diet is afforded them, without the disease making much progress ; but no sooner do they quit the institution, and are deprived of a regular and sufficient supply of nourishing food, than the case progresses with the utmost rapidity.

That insidious form of hydrocephalus so common in strumous children, is often brought on by a scanty or too impoverished diet ; but indeed the efficacy of this cause in developing scrofula in all its forms, is so much a matter of daily observation, as to be universally acknowledged.

The influence of the long continued use of an in-nutritious diet in impairing the mental faculties, and weakening the energies of the mind, is not a matter of mere speculation or curiosity, but one of vast

practical importance, as regards the happiness and prosperity of mankind.

The general fact, that the cerebral functions soon begin to suffer, when the bodily health is impaired by defective nutrition, has been already fully insisted upon. It is however quite possible, that a diet which may be sufficient to prevent the accession of any positive physical disease, may yet be too poor to supply the necessary vigour and stimulus to the brain, and may induce great deterioration of the intellectual faculties. But the most serious and permanently injurious consequences in this respect, arise from the full and complete growth of the cerebral organs being impeded in the young. It is now universally acknowledged that the mental manifestations are dependent on physical organization; when therefore, the healthy development of the latter is checked, by the use of a scanty or impoverished diet, that of the former suffers in a corresponding degree. This effect of inadequate nutrition in retarding intellectual development in children is often very conspicuous amongst the families of the indigent poor. They exhibit none of that intelligent vivacity and quickness, which children who have been plentifully supplied with nutritious food, display; their mental operations and physical movements are equally slow and languid, and their countenances want that look of intelligence and animation, which a full development and early exercise of the brain alone give.

Hence, the pernicious results of deficiency of food in early life are not confined to arresting the physical growth, and rendering the frame puny and feeble ; but, by checking cerebral development and the expansion of the intellectual faculties, favour that moral debasement and mental barbarism, so much to be lamented in the lower classes, and to which so many of their miseries, and so much of their poverty are attributable. The baneful effects of defective nutrition may thus be shown to extend their influence to the social condition and habits of the poor, to affect materially their position as moral and intelligent beings, and to bear powerfully upon matters with which at first sight, it might appear to have little connection.

It may be safely averred, that the happiness and prosperity of a nation will be in proportion to the intelligence and mental capabilities of its inhabitants, and that these will generally be found to correspond to the manner in which their physical wants and comforts are provided for. Ignorance and vice are always observed to accompany extreme poverty, and as long as the latter state continues, little progress can be effected in intellectual or moral improvement. It is vain to look for any advance in mental culture, in one whose life is passed in a continued struggle to preserve a mere existence ; and when all he can effect, by his utmost exertions, is to avert absolute starvation. The same effects will of course follow, if his poverty is the result of

his own improvidence ; and if, instead of providing himself with the wholesome necessities of life, he consumes his earnings in profligacy and dissipation.

It requires little penetration to foresee, that no system of education can prove generally beneficial to the poorer classes, which does not at the same time inculcate the necessity, and provide the means of relieving their poverty, ameliorating their physical condition, and supplying them with the common necessities of life ; for whilst they are suffering from the depressing effects, both moral and physical, of inadequate nutrition, they are little fitted to receive benefit from those means of acquiring intellectual improvement and useful information, which the more wealthy classes are now so zealously endeavouring to afford them. It is of the first importance to encourage habits of economy and temperance, to enforce the necessity of a provision for their physical wants, and to impress upon them the certainty of bad health and mental inferiority being the consequences of any neglect in this respect.

The first step towards improving the mind, is to preserve the health, by providing efficiently for the wants of the body.*

* It is hoped the foregoing observations will not be misunderstood. The author by no means wishes to imply, that defective nutrition is the chief cause of the intellectual debasement of even the most indigent classes. Want of education—of the opportunity of exercising the mind on objects calculated to expand the faculties—an unfavourable moral position—the enervation produced by dissipation, and a multitude of

The injurious effects of deficient food, are often much aggravated by the operation of other debilitating causes, with which it is occasionally associated; a few of which may be briefly alluded to.

Whenever the system is reduced by any constant drain, as leucorrhœa, the existence of a profusely discharging ulcer, some kinds of chronic catarrh, accompanied with copious expectoration, protracted lactation, &c., the effects of even a slightly diminished supply of food, are soon apparent, and dangerous symptoms quickly follow. The latter more especially is a very frequent cause of serious mischief amongst the poor; and some of the most severe examples of the morbid effects resulting from starvation, which I have met with, have occurred in women who were suckling. They are seldom able to provide for this unnaturally prolonged drain by any additional nourishment; and indeed they generally assign as the principal reason for continuing to suckle their children for so long a period, their inability to procure proper food for them; though probably the idea that they are less likely to become pregnant, weighs much with them. The symptoms do not vary from those of other cases; the sufferers are emaciated and pale, their mammæ are shrunk and flaccid, their ankles swell; they are subject to palpitations, breathlessness, attacks of vertigo, &c.

other causes, to which it is quite unnecessary to allude, have a much more extended and powerful influence than the one under consideration. All that he has been anxious to show, is, that deficiency of food acts as a very great barrier to intellectual improvement.

The rapidity with which dangerous symptoms are produced by scarcity of food, when at the same time the mind is much depressed and dispirited, or has no occupation, or object of interest to pursue, is in striking contrast to the extent to which abstinence and privation may be carried without injurious consequences, when the mind is buoyant and full of hope, or intent upon the accomplishment of some cherished design.

It is well known that mental despondency is one of the most powerful causes in predisposing the system to receive the morbid influence of malaria or other sources of infection, and to suffer from all kinds of injurious exposure: whilst mental excitement and hilarity of spirit have enabled men to resist disease under exposures, hardship, and want, of the most aggravated description.

This is well exemplified in the impunity with which victorious armies are enabled to bear the most severe hardships, famine, and harassing marches, whilst defeated soldiers fall a sacrifice to privations and fatigue of half the extent. In civil life, too, it is certain that the manufacturing population have, at times, borne a much greater extent of suffering and starvation, without the accession of disease, during a "turn out" or "strike" for higher wages, than they are capable of bearing when deprived of employment from commercial depression. It may, no doubt, be true, that in the former case they assist each other more readily, and

their little resources are more economically husbanded; but, nevertheless, I think it cannot be questioned, that their health is, in a great measure, upheld by the mental excitement and cheerfulness, consequent on the persuasion (however false and deluded it may be) that they are promoting their own welfare, and resisting oppression; aided by the seductive hope, that, by perseverance and a little temporary privation, they will defeat their employers, and accomplish their own object.

Perhaps one of the most striking examples, with which we are familiar, of the baneful consequences of an impoverished diet, when in co-operation with other depressing and deleterious circumstances, is that of the epidemic which prevailed at the Milbank Penitentiary, in 1823 and 1824; of which an account was given by Dr. Latham.* The following quotation on the subject is from the admirable work of Dr. Gooch. "The Penitentiary stands on a spot made for the production of malaria, a swamp below the level of the river, which runs within a few hundred yards of the prison. The prisoners were, with what object and for what reason, does not appear, suddenly put upon a diet from which animal food was almost entirely excluded. An ox's head, which weighs eight pounds, was made into peas soup, for one hundred people, which allows one ounce and a quarter of meat to each person.

* On the Diseases in the Milbank Penitentiary, by P. M. Latham, M. D., London: 1824.

After they had been living on this food for some time, they lost their colour, flesh, and strength, and could not do as much work as formerly. The men could not grind as much corn, or pump as much water as they once could; and the women fainted at their work in the laundry. At length this simple debility of constitution was succeeded by various forms of disease—they had scurvy, dysentery, diarrhæa, low fever, and lastly, affections of the brain and nervous system. To show the causes and nature of these diseases, it is necessary only to mention the striking fact, that while the prisoners who fed on this diet were growing weak and falling into disease, the officers of the prison, with their families and servants, who resided on the same spot, but lived well, entirely escaped; and the still more striking fact, that about twenty of the prisoners who were employed in the kitchen, and had an ample supply of meat and food, with two or three exceptions, continued healthy. The affections of the brain and nervous system, which came on during this faded, wasted, weakened state of body, were headache, vertigo, delirium, convulsions, apoplexy, and even mania.”*

No one who has had opportunities of observing the effects of protracted starvation, during periods of public distress, can have failed to remark the various degrees of suffering and disease, produced upon different persons, all similarly situated, in the

* Gooch on the Diseases of Women, London: 1831. p. 145.

same state of health, and enduring the same privations. This arises, in a great measure, from difference in temperament and constitution, and, probably from some other causes not so well understood. Persons of a lymphatic temperament are those who earliest show symptoms of disease from a deficient supply of food ; in them the nervous and vascular systems are naturally feeble, and they quickly become exhausted if not regularly supplied with proper nourishment. Such individuals possess little mental energy—they soon become dispirited, and are incapable of bearing up mentally as well as physically against disappointments and privations. When thrown out of employment, instead of exerting themselves to obtain a subsistence by some other means, they give way to despondency, appear to be devoid of all resources, and look upon their difficulties as irremediable ; whilst those of a sanguine temperament (and the term may be applied in its popular, as well as its physiological signification,) possessing greater mental and corporeal vigour, are more fertile in resources, and instead of sitting down to brood over their poverty, show an activity in devising means to remedy it.

Having noticed those circumstances which increase the susceptibility of the system to the morbid effects of deficient food, it may be remarked, that there are some peculiar states, in which the power of bearing abstinence is greatly augmented.

Very fat persons, for instance, can exist for a

much longer period on a diminished allowance of food, than those who are thin; for the obvious reason, that the absorption of the adipose tissue, affords a temporary supply of nutriment. A curious instance of the length of time which very fat animals will live without food, is related by Sir W. Hamilton, in his account of the earthquakes in Italy. "At Soriano," he says, "two fattened hogs, that had remained buried under a heap of ruins, were taken out alive the forty-second day; they were lean and weak, but soon recovered."*

Dr. Elliotson also refers to a similar one, where "a hog, weighing about a hundred and sixty pounds, was buried in its sty, under thirty feet of the chalk of Dover cliff, for one hundred and sixty days. When dug out it weighed but forty pounds, and was extremely emaciated, clean, and white.—There was neither food nor water in the sty, when the chalk fell. It had nibbled the wood, and eaten some loose chalk, which, from the appearance of the excrement, had passed more than once through the body.†"

In some kinds of illness, abstinence is endured better than in health, and in many diseases, a very low diet is one of the most important curative means. Patients have been known to recover from fever, for instance, who have taken nothing but mere diluents, containing scarcely the least nutritive matter, for many days; and in some

* Phil. Trans. Vol. 73. † Human Physiology. London: 1835. p. 53.

comatose cases, recovery has taken place after equally long fasting. Persons labouring under various anomalous affections of the nervous system, have sometimes endured very long abstinences, or lived on extraordinarily little food. Dr. Elliotson remarks,—“If abstinence is not forced upon the system, but is absolutely a part of disease, it may, like suspension of respiration in morbid states of insensibility, and like immense doses of powerful medicines in various diseased states, be borne with wonderful indifference.”* It would, therefore, be very fallacious to form any opinion as to the extent to which starvation, or a very spare diet could be carried, without injury to, or a loss of, life, from a consideration of the length of time which individuals labouring under disease have lived without taking any nutriment.

In intense mental occupation, not accompanied with much bodily exertion, abstinence has sometimes been voluntarily, sometimes unconsciously, endured, for very protracted periods, without much injury; and the same is not unfrequently seen in insanity. In these cases, the mind is so intently fixed on one object, or so completely absorbed in a particular train of thought, that it does not recognise the uneasy sensations of hunger and exhaustion, and the wants of the system fail to arrest its attention.

Almost every country has had its “fasting

* Human Physiology. . London: p. 54.

women," and the credulous, and lovers of the marvellous, in all ages, have been indulged with wonderful tales of extraordinary abstinence, and of individuals living without food; and even authors of high reputation have not been found wanting to record them. But the moral evidence, in these cases, has, upon examination, generally been found defective, and they have all proved, eventually, to have been examples of imposture and deception; practised from the hope of gain, or the love of notoriety.* They have generally occurred in fanatic, hysterical, or melancholic females, or persons of cunning or disordered imaginations.

Some narcotics, particularly opium and tobacco, have the power of relieving the pangs of hunger, and the feeling of exhaustion consequent on long fasting. The former is constantly used in eastern countries for this purpose, when food cannot be procured; and the property which the latter possesses in this respect is well known to sailors, who find great relief from it, when suffering from scarcity of provisions. This effect is produced by the sedative operation of these substances on the brain and nervous system generally, and on the nerves of the stomach more especially, whereby the system is rendered less conscious of the uneasy sensations consequent on abstinence, and the usual constitutional disturbance resulting therefrom is subdued. Many of the cases of starvation occur-

* Sketches of Imposture, Deception, and Credulity. London: 1837. p. 160.

ring among the lower orders, are much aggravated by the abstraction of tobacco, which, from their poverty, they have been no longer able to procure ; just in the same way as persons who have habitually consumed large quantities of intoxicating fluids, suffer more early and more severely, when, in addition to a deficient supply of food, their wonted stimulus is withdrawn.

CHAPTER IV.

THE PATHOLOGY OF INANITION.

Much that relates to the pathology of the effects which result from deficiency of food has been already stated, in previous parts of this paper. Nevertheless, it will neither be useless nor uninteresting, to point out the morbid condition of the individual organs, on which the more important symptoms depend, and to investigate their proximate cause, or the mode in which they are produced.

The immediate effect of a deficient supply of nutritious food, is a diminished formation of chyle, and a consequent reduction in the mass of blood. But besides this diminution of the circulating fluid in the system, defective nutrition likewise induces a morbid alteration in its constituents ; it is found to contain less fibrine, fewer red particles, and a larger proportion of serum. It coagulates less firmly, and decomposes earlier than healthy blood.

The vital properties of the blood seem mainly to depend on the fibrine and red particles, and their deficiency renders it less fitted for the nutrition of the body, and for affording that stimulus to the various organs, which is requisite for their healthy action.

Any deficiency in the aqueous portion is prevented by the ingestion of water, to which the sufferer is prompted by the sensation of thirst ; but for the renewal of the other ingredients, a supply of nutritious food is necessary.

In consequence of the diminished quantity, and impoverished quality of the blood transmitted to the different viscera, their functions are imperfectly performed, and the vital powers of the system lowered. The secretions and excretions generally are lessened, and many of them altered in composition ; so that matters which ought to be thrown off from the body are retained, and act injuriously on the system. Those however, which require only the watery portion of the blood for elimination, are not materially decreased : the exhalation from the skin, for instance, is not deficient ; the mouth and tongue are kept moist by their secretions, and the urine is generally abundant, though limpid, and containing less of its peculiar saline and animal matters.

The palpitations of the heart must be referred to the irritability of that organ, produced in part by the diminished quantity, and in part by the impoverished quality of the blood ; increased also by the irritable state of the nervous system. It is probable the sighing so frequent in this state, is an effort of nature to favour the flow of blood to the lungs and centre of circulation, by the expansion of the chest, which the act of sighing causes.

Diarrhæa has been mentioned as a frequent con-

sequence of the continued use of a very innutritious diet. It probably arises from the irritation produced by the passage of the contents of the intestines over the mucous membrane, when insufficiently unprotected by its usual abundant secretion. Sometimes it is probably owing to the unwholesome and indigestible food, which, in periods of distress, the poor are too often compelled to use. The efficacy of an impoverished diet in producing irritation and ulceration of the mucous membrane of the alimentary canal, has been long known, both from observations on man, and experiments made on animals. In the epidemic which prevailed at the Milbank Penitentiary, diarrhæa and dysentery were the most constant symptoms. When the effects of imperfect nutrition have been long in operation, and the vital powers are greatly lowered, the mucous membrane of the intestines becomes softened, and its organic cohesion loosened; the exhalant vessels become relaxed, and their tonicity so much destroyed, as to permit blood to pass through them, and a bloody grumous diarrhæa is the consequence. This admixture of red particles in the evacuations always indicates a breaking up, or disorganization of the mucous tissue, and is observed towards the fatal termination of some cases of fever.

The pathological state of the brain on which the symptoms referrible to this organ depend, is an inquiry of the deepest interest, and of great importance in a therapeutic point of view.

By many writers they have been attributed to a deficient supply of blood to the brain;* but a great number of facts might be collected, which render it extremely probable, that the usual quantity of blood still remains in the parts within the skull, though the aggregate amount of this fluid in the system has been greatly reduced; and the experiments of Dr. Kellie prove, that, even when animals have been bled to death, and all other parts of the body are drained of blood, the quantity in the brain is not sensibly diminished.† These experiments seem to have been made with great care, but whether they strictly warrant the conclusions which he and others have drawn from them, relative to the cerebral circulation, may admit of some doubt; because instances have been recorded, where the brain has been found decidedly deficient in blood, when no effusion of any kind had occurred to supply its place, and when the integrity of the cranium had been preserved;‡ which, if his deduc-

* Much confusion has been caused in the discussion of this question, by the use of vague expression. If the term, "deficient supply of blood to the brain," is merely meant to signify, that a less amount of this fluid than usual is transmitted to that organ from the heart, the expression is strictly correct, and the explanation, as far as it goes, perfectly true. But it is generally intended at the same time to imply, that the quantity contained in the brain is diminished, which is at least very doubtful.

† Vide "*Medico-Chirurgical Transactions of Edinburgh*."—Vol. 1,—where a very interesting account of Dr. Kellie's explanation of this fact, and his views respecting the cerebral circulation will be found.

‡ In an account of the post mortem appearances found in the body of a man who died in prison, at Toulouse, from abstinence, very minutely detailed by Dr. Desbarreux Bernard: he states, that the substance of the brain was blanched. (*Dictionnaire de Médecine*.) My friend, Mr.

tions were correct, could never by any possibility happen, except in hypertrophy of that organ. His experiments have, however, fully demonstrated the difficulty of depleting the brain, to any appreciable extent, by bleeding, or at least of materially lessening the contents of the cranium.

With regard to the proximate cause of the cerebral symptoms produced by inanition, it perhaps would not be difficult to offer at least a plausible, if not a perfectly satisfactory explanation of them, without the necessity of supposing any material deficiency of blood in the brain.

Notwithstanding that the general mass of blood in the body is much reduced, and the action of the heart languid and enfeebled, it may, nevertheless, be supposed, that the brain still contains its usual quantity of this fluid ; because any deficient supply by the arteries, is compensated for by a proportionately decreased flow by the veins. From the diminished quantity, however, which is sent to the head at each contraction of the heart, a much smaller quantity than usual will necessarily pass through the brain in a given time, and the circulation there will be much retarded. In consequence of

Watson Beever, also found the brain almost destitute of blood, in two cases of simple concussion, when the examination was made with great care.

It cannot, however, be denied, that, whilst a preternaturally congested state of the brain is common, it is very rare to find it strikingly exsanguinated. Even in cases of phthisis and other exhausting diseases, where death has taken place very gradually, the brain seldom displays any unusual deficiency of blood, though the other parts of the body are pale and bloodless.

this, the whole mass of cerebral blood is not changed with sufficient rapidity, but remains such a protracted length of time in the brain, without being subjected to the vivifying action of air in the lungs, that its properties become greatly deteriorated, and it is rendered unfit to fulfil its appropriate office.

Without denying, therefore, the possibility that the diminished sensibility, obtuseness of the mental faculties, and tendency to syncope, described as amongst the early symptoms of defective nutrition, may be in some degree attributable to a diminished quantity of blood in the brain ; it seems by no means improbable, that these symptoms may be owing to the languid and retarded circulation just alluded to, (by which the due renewal of the blood is delayed,) aggravated by the impoverished condition of this fluid ; in consequence of which it is incapable of imparting the necessary stimulus to the nervous centre. Such a state of the circulation, if continued for any length of time, would be well calculated to favour congestion in the veins and capillaries, which would produce the lethargic state which follows ; and the serious effusion (which it is highly probable usually takes place towards the termination of fatal cases) would be a natural consequence of this congestion.

It must be confessed, however, that the subject of the cerebral circulation, both in its healthy and morbid conditions, is involved in much obscurity ; and it seems highly probable, that in reasoning upon

it, too much weight has been attached to the agency of physical laws, and sufficient regard has not been paid to the effects of vital action in modifying them.

It is certainly difficult to accede to the opinion, that, in states of great exhaustion, and when the quantity of blood in the body is much reduced, there is (before any reaction has taken place) as much blood contained within the cranium, as in a plethoric state of the system; and I wish it to be understood, that I offer these remarks on the pathological state of the brain with much hesitation and doubt.

CHAPTER V.

THE MORBID APPEARANCES AFTER DEATH FROM INANITION.

It is a matter of some importance to note accurately, the morbid appearances found in the bodies of those who have died from starvation. This knowledge not only assists us materially in directing our treatment of persons whose lives may be in danger from this cause, but is likewise interesting in elucidating many obscure points in pathological and physiological inquiries, and is especially important in a medico-legal point of view.

The legislature of this country has humanely endeavoured to make provision for all cases of positive distress, and has ordered that those who are unable to obtain a livelihood for themselves, shall be supported by the contributions of the more affluent. If, therefore, a suspicion arises that any one has died from the effects of starvation, either through mismanagement, inhumanity, or negligence in the administration of the law, the indignation of the public is justly aroused; and should the allegation prove correct, those to whom the duty of relieving the poor has been entrusted incur censure,

and are liable to be punished. Under these circumstances, medical men are sometimes called upon to give an opinion as to the cause of death, from the *post mortem* appearances alone.

The most constant appearances after death from inanition are the following :

The body is much emaciated, and quite devoid of fat ; it is less rigid than usual, from the diminished tonicity, or inherent contractile power, of the muscular fibre. It is said to exhale an unusually fetid odour, and that putrefaction advances with more than ordinary rapidity.

In the head, effusion of serum is usually found in the ventricles of the brain or between its investing membranes ; sometimes the cerebral substance and pia mater are congested ; less frequently natural in appearance, and more rarely they have been found blanched.

All the other organs are pale and exsanguineous, and their bulk is diminished. The quantity of blood in the vessels is very small, and seems, from its watery thinness and pale colour, to be deficient of fibrine and red particles. The heart is usually empty, and it, in common with all other muscular structures, is pale and flabby. The stomach and alimentary canal are contracted ; the intestines are devoid of feculent matter, and their peritoneal and muscular coats thin, whilst the mucous membrane is often congested, softened, and ulcerated. The gall bladder is invariably distended with bile. As themost

frequent victims of starvation occur (as was formerly mentioned) among invalids, and persons labouring under some chronic complaint, a diseased state of the lungs, or some other organ is often found.

It is indeed of great importance to bear in mind, that no extent of structural disease, discovered on a *post mortem* examination, is any proof that death has not been caused by deficiency of food.

All these appearances, it must be admitted, are of a negative character, and it may be unhesitatingly affirmed, that there are no specific or essential signs, by which death from deficiency of food, can with certainty be distinguished. The emaciation is not greater, often not so extreme, as is frequently witnessed in phthisis, marasmus, or many chronic diseases; nor is the exsanguinated state of the body, or watery condition of the blood, more remarkable than in some cases of chlorosis. It must not be forgotten, too, that examples are not wanting of persons having died of epilepsy or apoplexy, without any trace of disease, or alteration of structure having been detected, on the most careful *post mortem* examination; and very delicate persons have been known to expire suddenly, on rising into the erect posture, apparently from syncope, in whose bodies no morbid appearances could be discovered; except, perhaps, an empty state of the cavities of the heart. Now, if death were to occur, under such circumstances, in an emaciated individual amongst the poor, suspicion of starvation

might be excited, and an examination of the body would throw little light on the subject.

The morbid appearances after death from cold, and more particularly repeated or excessive hæmorrhagies, are, in many respects, very similar to those consequent on inanition. Hence the extreme difficulty of giving a decided opinion, and the caution it is necessary to observe in doing so, when the patient has not been seen during life.

CHAPTER VI.

DIAGNOSTIC MARKS OF THE MORBID STATES PRODUCED BY STARVATION.

Although there would be little risk of confounding the symptoms of starvation with those of any other state, if an accurate account of the patient could always be obtained; yet, from defective information, perplexing cases are occasionally met with. Paradoxical as it may seem, excess and abstinence are capable of producing similar symptoms, and it sometimes requires the nicest discrimination on the part of the physician, to distinguish between the cerebral oppression or irritation caused by the former, and the depression or exhaustion consequent on the latter.

We have seen, that the accession of coma is one of the most severe and fatal signs of exhaustion from defective nutrition. This symptom has been too indiscriminately regarded as indicating a determination of blood to the head or pressure on the brain, and as requiring abstraction of blood for its removal. It must never be forgotten, however, that it often arises from a very opposite state of the system—defective circulation, exhaustion, or

deficiency of nervous power. Coma itself affords no evidence of the state of the brain, unless taken in conjunction with other symptoms and the history of the case. This important fact has been fully illustrated in the writings of Drs. Marshall Hall, Gooch, and Abercrombie.

Coma arising from exhaustion generally comes on gradually, though sometimes the attack of insensibility is sudden. It is not uncommon, for instance, for an individual exhausted with abstinence, to become giddy, stagger, and fall down senseless in the street. As soon as he is discovered, he is perhaps conveyed to an hospital, stupified and cold, with almost suspended action of the heart and respiration, and unable to answer questions. Now, let us suppose that the miserable condition of the sufferer had attracted the pity of some passer by, and that he had expended the pittance bestowed upon him at a dram shop, with the hope of reviving his prostrated strength, the alcoholic draught would very probably, by its powerful effect on so exhausted a frame, hasten that insensibility it was taken to avert. When in this state, his breath would be perceived to be tainted with the smell of spirits, and he would probably be considered by those who saw him, to be in a state of disgusting intoxication, and left neglected to perish from cold and exhaustion. Such is by no means a rare case, and one which all who have been long attached to a public medical charity must have witnessed. The stupor,

staggering, occasional wandering of the mind, and insensibility, consequent on exhaustion from starvation, are constantly mistaken by the public for intoxication; and though, in the state of the pulse and pale collapsed appearance of the countenance, the medical man has symptoms to guide him, in forming a diagnosis, yet, if an individual, in the insensibility of intoxication, has been long exposed to cold, the pulse becomes so much reduced and the countenance so much altered, as to afford no certain criterion. Now, although it must be admitted, that it is scarcely possible any error could be made in the treatment of such cases by any well informed medical man who examined the patient, yet they do not the less show, that the *cause* of the symptoms may often admit of doubt.

Mistakes sometimes occur from culpable negligence on the part of the practitioner, and in illustration of this, I will take the liberty of giving another fictitious case. Let us suppose, for instance, a patient to present himself, complaining of langour, headache, vertigo, occasional dimness of sight, tinnitus aurium, and confusion of thought, a small pulse, foul tongue, and constipated bowels—a group of symptoms which often precede an apoplectic seizure. His medical attendant hastily concludes he is threatened with an attack, and orders him to lose blood, and be purged immediately. If he is bled from the arm, the patient in all probability faints before the loss of a third of the pre-

scribed quantity of blood, and he is saved from fatal mischief, but with a lamentable aggravation of all his symptoms. Should the application of leeches have been ordered, matters will perhaps be still worse, because syncope is less likely to occur to arrest the flow of blood, and a larger quantity will probably be abstracted. Such an occurrence could not happen to an intelligent practitioner, if the history of the case was carefully inquired into ; but from the hurried and flippant manner in which patients are sometimes prescribed for, errors of this nature do accidentally occur.

Women, suffering from the combined effects of protracted lactation and deficiency of food, often exhibit symptoms which might be mistaken for cerebral or pulmonary congestion, requiring the abstraction of blood ; and as in them the loose texture surrounding the eyes is frequently a little distended, and the face often rather tumid, from slight serous infiltration of the cellular tissue, their emaciated condition is less apparent, and does not always strike us at a first glance ; but the history of the case at once discloses its nature. It ought, however, to be noticed, that these patients are in the constant habit of concealing the fact of their continuing to suckle, so that the cause of their exhaustion is sometimes not detected.

With regard to the state of the circulation, it will be well to bear in mind, that when patients have walked to a dispensary, or come from a

distance to obtain medical advice, the exertion often gives a temporary rapidity and throbbing to the pulse, which might mislead those, who are forgetful of this circumstance, in judging of the nature of the case.

I may also mention here, a circumstance connected with the pulse, which I have often observed, viz., that when coma supervenes towards the termination of diseases of exhaustion, and the pulse becomes slower, it often acquires a degree of fullness, and gives an idea of strength, quite at variance with its previous character, and little to have been anticipated from the debilitated state of the system.

CHAPTER VII.

THE TREATMENT OF THE MORBID EFFECTS OF DEFICIENCY OF FOOD.

In ordinary cases, the consequences of deficiency of food are quickly removed by a plentiful supply of nutritious aliment; but when the abstinence has been long in duration, or extreme in degree, and the system has been excessively reduced, an indiscriminate allowance of food would be highly injudicious, and attended with considerable risk, so that it is often necessary to observe much caution in its administration.

When persons have long been subjected to a deficient or greatly impoverished diet, atony of the stomach and an irritable and morbidly sensitive state of the bowels are produced, the digestive powers are impaired, and a sudden change to very nutritious food cannot be made without creating much constitutional disturbance and disorder in the alimentary canal.

In the management of the cases under consideration, it is exceedingly important to bear in mind, that, whenever the system has been much reduced by inanition, the function of absorption is in a high

state of activity. From the energetic and rapid manner in which absorption is then performed, all medicines act with greatly increased power and celerity, so that much smaller doses are required than in ordinary cases. This is an interesting fact, and enjoins caution in the administration of remedies. Even the use of articles of food which have not usually any stimulating effect, is followed by great excitement. I once knew an instance where a copious draught of milk, given to a woman in a state of great exhaustion, from fasting, immediately brought on giddiness, and caused her to stagger and fall down. The powerful effect of a very small quantity of any alcoholic fluid, on an individual whose stomach is empty, and who is much exhausted from long fasting, is well known, and persons, under such circumstances, are often surprised at the inebriated feeling they experience from a very small portion, who are in the daily habit of consuming large quantities after dinner, without any such effect.

On the contrary, in very plethoric and overfed persons, absorption is fortunately at its lowest ebb, and by this cause they are often saved from the effects of repletion and excess;—or, at least, the day of retribution is procrastinated.

Sudden changes are always hurtful to the system, and cannot be made with impunity. When persons have been long subjected to a very deficient or innutritious diet, we are more likely to do mischief

by over-feeding at first, than by being too sparing. Such a diet should be employed as will support the returning strength of the patient, and yet not be too stimulating. The food should not be too concentrated, should be given in small quantities at a time, and frequently repeated. Gruel, bland farinaceous substances, as sago and arrow root, light puddings, weak broth, jelly, and such mild articles as are easy of digestion, are the most appropriate ; and their effects must be carefully noticed before solid animal food is allowed.

Watchful attention to the above directions, with regard to the dietetic regimen, is often all that is necessary ; but when dangerous symptoms exist, and the exhaustion is so great as to threaten life, prompt remedial measures are required, and much may be effected by the judicious administration of medicines.

The first thing to be attended to, is, to have the patient placed in the horizontal position, which must be carefully maintained, and its necessity strictly enjoined upon the attendants, for there is little doubt that many persons in states of extreme exhaustion, (by whatever cause induced) have died from being inadvertently raised erect by those who had the charge of them. The restoration of the temperature of the body must be assisted by the application of warm flannels and by friction.

Failure of the heart's action, stupor, and insensibility, are usually the most pressing symptoms in

dangerous cases, and, of course, are to be combated by the exhibition of stimulants; such as ammonia, æther, and alcoholic liquors. Of these, ammonia is generally to be preferred, because it is not only the most powerful, but has also the advantage of not being followed by those sedative effects which the generality of stimulants ultimately produce, and may be given largely without any injurious consequences.

The best preparation is the *spiritus ammoniæ aromaticus*, and it may be given in warm brandy and water. It is requisite to repeat it very frequently, for its effects soon pass off, and its exhibition must be continued till an improvement in the patient's state takes place. If positive coma exists, the more powerful sesquicarbonate of ammonia may be substituted, and ought to be given with persevering assiduity. We must not be deterred from resolutely using this remedy, with brandy or wine, from any fear that the brain is "labouring" or congested, or be tempted, with a view of relieving this, to abstract blood at this state of our treatment; because whether such be the case or not, that is not the treatment calculated to remove it.

A strong mustard cataplasm or heated ammoniated liniment applied over the epigastrium, at the back of the neck or along the spine, may sometimes assist in rousing the sinking powers, but they are often almost inert when the cuticular sensibility and circulation are so much reduced.

The state of the pulse, temperature of the skin, and improved appearance of the countenance, will indicate when our stimulants have been carried far enough, and are no longer necessary.

When patients begin to rally from that senseless and stupified state, into which they have been thrown by starvation, they are often at first lightly incoherent, and have a wildness in their manner and expression of countenance, similar to persons recovering from syncope. After the first danger of dying in the sinking state is removed, a new train of symptoms is apt to set in, which demand great watchfulness, because a change of remedies is then required. These are, flushing of the face, intolerance of light, headache, restlessness, delirium, a dry tongue, and quick pulse. This state of reaction is, perhaps, in part produced by our previous stimulating remedies; and though the urgency of the patient's condition rendered them requisite, yet, it shows us the propriety of not continuing them longer than is necessary to remove the present danger. Generally nothing more is required for the relief of these symptoms than diluents, keeping the head cool, and darkening the room. But we must be cautious in not confining the patient too strictly to mere diluents, or we may prolong the debility which has occasioned all the mischief, and engender an irritable state of the system, which it is often extremely difficult to subdue. Broth, beef tea, sago, or arrow root, made so thin that they

can be drank, and to which a little wine has been added, may be given freely with advantage. Sometimes such evidence of congestion or inflammation within the head may exist, that the application of a few leeches may now be necessary. But we must be careful not to mistake the effects of mere irritation for these states, and abstract blood, instead of administering a sedative. It has been aptly said, that debility is the parent of irritability : and the facility with which the latter is excited, during the progress of recovery from the effects of inanition, fully proves its truth.

In that form of the affection where there is great wakefulness, restlessness, more delirium, and rather a state of irritability and excitement than depression of the nervous system; and which is often met with when the effects of starvation are associated with those of intemperance, sedative remedies are of signal service, and must be given in doses sufficient to produce their full operation ; whilst the strength is duly supported by nourishment. And it must not be forgotten, that such persons having been long accustomed to powerful stimulants, larger doses are required than, from what has been said of the activity of absorption, might have been anticipated. Opium, alone, or in combination with camphor or hyoscyamus, according to circumstances, is the most valuable. Wine or brandy must also be more freely given in such cases.

If the symptoms assume those of fever, they

will require to be treated on the usual principles : with this due precaution, however, that the vital powers being greatly reduced, earlier sinking may be looked for, and must be guarded against.

If the bowels should be confined, so that an aperient is necessary, the mildest should be chosen, as castor oil or rhubarb. Indeed, whether constipation exists or not, the occasional exhibition of a laxative is beneficial, as it removes the remains of the disordered secretions poured into the alimentary canal. The combination of a small quantity of mercurial pill with rhubarb is frequently useful in establishing a healthy state of the digestive organs.

Pain in the stomach is often a troublesome and obstinate symptom, after the other effects of starvation have disappeared. Occasionally it is constant: sometimes it comes on only after eating, is generally aggravated by animal food, and is least felt when a light farinaceous diet is used. The bismuthi trisnitrates or acidum hydrocyanicum has seemed to be more serviceable in removing it, than anything else. The acetate or hydrochlorate of morphia is also often beneficial, and affords great relief.

It may be remarked that, during convalescence from the effects of deficiency of food, congestions are very apt to occur, which require blisters, and sometimes leeches or cupping. This is a natural consequence of the weakened state of the circulation. Pains of a neuralgic character, particularly of the head, are often experienced, for the removal

of which quinine or iron, alone, or in combination with morphia, is generally effectual. If palpitations and irregular action of the heart should be troublesome, they will be most speedily relieved by the judicious combination of tonics and sedatives. A defective appetite, swelling of the legs, or other symptoms indicating a want of tone in the system, will suggest the propriety of administering tonics.



